Analytical Laboratory

13339 Hagers Ferry Road
Huntersville, NC 28078-7929
McGuire Nuclear Complex - MG03A2
Phone: 980-875-5245 Fax: 980-875-4349

Order Summary Report

Order Number: **J13020369**

Project Name: WWTS - Biweekly (2)

Customer Name(s): Bill Kennedy, Melonie Martin, Wayne Chapman, Travis Thornton

Customer Address: 3195 Pine Hall Rd
Mailcode: Belews Steam Station
Belews Creek, NC 28012

Lab Contact: Jason C Perkins Phone: 980-875-5348

Report Authorized By: (Signature) Digitally signed by jay perkins DN: cn=jay perkins, o=Analytical Lab, ou, email=jay.perkins@duke-energy.com, c=US Date: 2013.03.26 14:30:43 -04'00'

Jason C Perkins

Date: 3/26/2013

Program Comments:

Please contact the Program Manager (Jason C Perkins) with any questions regarding this report.

Data Flags & Calculations:

Any analytical tests or individual analytes within a test flagged with a Qualifier indicate a deviation from the method quality system or quality control requirement. The qualifier description is found at the end of the Certificate of Analysis (sample results) under the qualifiers heading. All results are reported on a dry weight basis unless otherwise noted. Subcontracted data included on the Duke Certificate of Analysis is to be used as information only. Certified vendor results can be found in the subcontracted lab final report. Duke Energy Analytical Laboratory subcontracts analyses to other vendor laboratories that have been qualified by Duke Energy to perform these analyses except where noted.

Data Package:

This data package includes analytical results that are applicable only to the samples described in this narrative. An estimation of the uncertainty of measurement for the results in the report is available upon request. This report shall not be reproduced, except in full, without the written consent of the Analytical Laboratory. Please contact the Analytical laboratory with any questions. The order of individual sections within this report is as follows:

Job Summary Report, Sample Identification, Technical Validation of Data Package, Analytical Laboratory Certificate of Analysis, Analytical Laboratory QC Reports, Sub-contracted Laboratory Results, Customer Specific Data Sheets, Reports & Documentation, Customer Database Entries, Test Case Narratives, Chain of Custody (COC)

Certification:

The Analytical Laboratory holds the following State Certifications : North Carolina (DENR) Certificate #248, South Carolina (DHEC) Laboratory ID # 99005. Contact the Analytical Laboratory for definitive information about the certification status of specific methods.

Sample ID's & Descriptions:

Sample ID	Plant/Station	Collection Date and Time	Collected By	Sample Description
2013004289	BELEWS	27-Feb-13 7:30 AM	TO	FGD Purge Eff
2013004290	BELEWS	27-Feb-13 7:30 AM	TO	EQ TANK EFF.
2013004291	BELEWS	27-Feb-13 7:30 AM	TO	BIOREACTOR 1 INF.
2013004292	BELEWS	27-Feb-13 7:30 AM	TO	BIOREACTOR 2 INF.
2013004293	BELEWS	27-Feb-13 7:30 AM	TO	BIOREACTOR 2 EFF.
2013004294	BELEWS	27-Feb-13 7:30 AM	TO	FILTER BLANK
2013004295	BELEWS	27-Feb-13 7:30 AM	TO	Trip Blank

7 Total Samples

Technical Validation Review

Checklist:

COC and .pdf report are in agreement with sample totals and analyses (compliance programs and procedures).	☑ Yes	☐ No
All Results are less than the laboratory reporting limits.	☐ Yes	☑ No
All laboratory QA/QC requirements are acceptable.	☑ Yes	☐ No

The following vendor labs are Pending Qualifi Applied Speciation

Report Sections Included:

- ☑ Job Summary Report
- ☑ Sample Identification
- ☑ Technical Validation of Data Package
- ☑ Analytical Laboratory Certificate of Analysis
- ☐ Analytical Laboratory QC Report
- ☑ Sub-contracted Laboratory Results
- ☐ Customer Specific Data Sheets, Reports, & Documentation
- ☐ Customer Database Entries
- ☑ Chain of Custody
- ☑ Electronic Data Deliverable (EDD) Sent Separately

Reviewed By: DBA Account Date: 3/26/2013

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J13020369

Site: FGD Purge Eff — **Sample #: 2013004289**

Collection Date: 27-Feb-13 7:30 AM — Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Bromide	**110**	mg/L		5	50	EPA 300.0	03/15/2013 21:36	BGN9034
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**282**	ug/L		5	100	EPA 245.1	03/07/2013 14:17	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**9.35**	mg/L		0.05	10	EPA 200.7	03/18/2013 15:15	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**205**	mg/L		0.5	10	EPA 200.7	03/12/2013 11:22	MHH7131
Manganese (Mn)	**10.9**	mg/L		0.05	10	EPA 200.7	03/12/2013 11:22	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**410**	ug/L		10	10	EPA 200.8	03/20/2013 12:51	DJSULL1
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**350**	ug/L		10	10	EPA 200.8	03/08/2013 15:16	KRICHAR
Chromium (Cr)	**300**	ug/L		10	10	EPA 200.8	03/08/2013 15:16	KRICHAR
Copper (Cu)	**171**	ug/L		10	10	EPA 200.8	03/08/2013 15:16	KRICHAR
Nickel (Ni)	**252**	ug/L		10	10	EPA 200.8	03/08/2013 15:16	KRICHAR
Selenium (Se)	**4630**	ug/L		10	10	EPA 200.8	03/08/2013 15:16	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:16	KRICHAR
Zinc (Zn)	**305**	ug/L		10	10	EPA 200.8	03/08/2013 15:16	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C
TOTAL DISSOLVED SOLIDS								
TDS	**19000**	mg/L		200	1	SM2540C	03/05/2013 15:35	SWILLI3

Site: EQ TANK EFF. — **Sample #: 2013004290**

Collection Date: 27-Feb-13 7:30 AM — Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**169**	ug/L		2.5	50	EPA 245.1	03/07/2013 14:19	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**9.02**	mg/L		0.05	10	EPA 200.7	03/18/2013 15:19	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**212**	mg/L		0.5	10	EPA 200.7	03/12/2013 11:26	MHH7131
Manganese (Mn)	**9.85**	mg/L		0.05	10	EPA 200.7	03/12/2013 11:26	MHH7131

Certificate of Laboratory Analysis

Order # J13020369

Site: EQ TANK EFF. **Sample #: 2013004290**

Collection Date: 27-Feb-13 7:30 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**247**	ug/L		10	10	EPA 200.8	03/20/2013 12:54	DJSULL1
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**242**	ug/L		10	10	EPA 200.8	03/08/2013 15:20	KRICHAR
Chromium (Cr)	**216**	ug/L		10	10	EPA 200.8	03/08/2013 15:20	KRICHAR
Copper (Cu)	**127**	ug/L		10	10	EPA 200.8	03/08/2013 15:20	KRICHAR
Nickel (Ni)	**202**	ug/L		10	10	EPA 200.8	03/08/2013 15:20	KRICHAR
Selenium (Se)	**3310**	ug/L		10	10	EPA 200.8	03/08/2013 15:20	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:20	KRICHAR
Zinc (Zn)	**227**	ug/L		10	10	EPA 200.8	03/08/2013 15:20	KRICHAR

Site: BIOREACTOR 1 INF. **Sample #: 2013004291**

Collection Date: 27-Feb-13 7:30 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
DISSOLVED METALS BY ICP								
Manganese (Mn)	**3.44**	mg/L		0.05	10	EPA 200.7	03/18/2013 15:23	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**210**	mg/L		0.5	10	EPA 200.7	03/12/2013 11:30	MHH7131
Manganese (Mn)	**4.97**	mg/L		0.05	10	EPA 200.7	03/12/2013 11:30	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**95.3**	ug/L		10	10	EPA 200.8	03/20/2013 12:57	DJSULL1
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:23	KRICHAR
Chromium (Cr)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:23	KRICHAR
Copper (Cu)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:23	KRICHAR
Nickel (Ni)	**40.4**	ug/L		10	10	EPA 200.8	03/08/2013 15:23	KRICHAR
Selenium (Se)	**114**	ug/L		10	10	EPA 200.8	03/08/2013 15:23	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:23	KRICHAR
Zinc (Zn)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:23	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C

Certificate of Laboratory Analysis

Order # J13020369

Site: BIOREACTOR 2 INF. **Sample #: 2013004292**

Collection Date: 27-Feb-13 7:30 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**217**	mg/L		0.5	10	EPA 200.7	03/12/2013 11:34	MHH7131
Manganese (Mn)	**4.97**	mg/L		0.05	10	EPA 200.7	03/12/2013 11:34	MHH7131
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:27	KRICHAR
Chromium (Cr)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:27	KRICHAR
Copper (Cu)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:27	KRICHAR
Nickel (Ni)	**12.9**	ug/L		10	10	EPA 200.8	03/08/2013 15:27	KRICHAR
Selenium (Se)	**12.0**	ug/L		10	10	EPA 200.8	03/08/2013 15:27	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:27	KRICHAR
Zinc (Zn)	**< 10**	ug/L		10	10	EPA 200.8	03/08/2013 15:27	KRICHAR

Site: BIOREACTOR 2 EFF. **Sample #: 2013004293**

Collection Date: 27-Feb-13 7:30 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Bromide	**120**	mg/L		5	50	EPA 300.0	03/15/2013 21:55	BGN9034
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**< 1**	ug/L		1	20	EPA 245.1	03/07/2013 14:21	AGIBBS
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**236**	mg/L		0.5	10	EPA 200.7	03/12/2013 11:38	MHH7131
Manganese (Mn)	**5.01**	mg/L		0.05	10	EPA 200.7	03/12/2013 11:38	MHH7131
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 5**	ug/L		5	5	EPA 200.8	03/08/2013 15:30	KRICHAR
Chromium (Cr)	**< 5**	ug/L		5	5	EPA 200.8	03/08/2013 15:30	KRICHAR
Copper (Cu)	**< 5**	ug/L		5	5	EPA 200.8	03/08/2013 15:30	KRICHAR
Nickel (Ni)	**< 5**	ug/L		5	5	EPA 200.8	03/08/2013 15:30	KRICHAR
Selenium (Se)	**< 5**	ug/L		5	5	EPA 200.8	03/08/2013 15:30	KRICHAR
Silver (Ag)	**< 5**	ug/L		5	5	EPA 200.8	03/08/2013 15:30	KRICHAR
Zinc (Zn)	**< 5**	ug/L		5	5	EPA 200.8	03/08/2013 15:30	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C

Certificate of Laboratory Analysis

Order # J13020369

Site: FILTER BLANK **Sample #: 2013004294**

Collection Date: 27-Feb-13 7:30 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
DISSOLVED METALS BY ICP								
Manganese (Mn)	**0.023**	mg/L		0.005	1	EPA 200.7	03/18/2013 15:07	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**< 1**	ug/L		1	1	EPA 200.8	03/20/2013 12:44	DJSULL1

Site: Trip Blank **Sample #: 2013004295**

Collection Date: 27-Feb-13 7:30 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**< 0.05**	mg/L		0.05	1	EPA 200.7	03/12/2013 11:18	MHH7131
Manganese (Mn)	**< 0.005**	mg/L		0.005	1	EPA 200.7	03/12/2013 11:18	MHH7131
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 1**	ug/L		1	1	EPA 200.8	03/08/2013 15:13	KRICHAR
Chromium (Cr)	**< 1**	ug/L		1	1	EPA 200.8	03/08/2013 15:13	KRICHAR
Copper (Cu)	**< 1**	ug/L		1	1	EPA 200.8	03/08/2013 15:13	KRICHAR
Nickel (Ni)	**< 1**	ug/L		1	1	EPA 200.8	03/08/2013 15:13	KRICHAR
Selenium (Se)	**< 1**	ug/L		1	1	EPA 200.8	03/08/2013 15:13	KRICHAR
Silver (Ag)	**< 1**	ug/L		1	1	EPA 200.8	03/08/2013 15:13	KRICHAR
Zinc (Zn)	**< 2**	ug/L		2	1	EPA 200.8	03/08/2013 15:13	KRICHAR

SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)

Vendor Parameter	**Complete**	Vendor Method	V_AS&C

APPLIED SPECIATION
AND CONSULTING, LLC

18804 Northcreek Parkway Bothell, WA, 98011
Tel: (425) 483-3300 Fax: (425) 483-9818
www.appliedspeciation.com

March 8, 2013

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078
(704) 875-5245

Project: Belews - FGD WWTS Bi-Monthly Sampling) (LIMS #J13020369)

Dear Mr. Perkins,

Attached is the report associated with four (4) aqueous samples submitted for selenium speciation on February 28, 2013. The samples were received in a sealed cooler at 1.7°C on March 1, 2013. Selenium speciation analysis was performed via ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS). Any issues associated with the analysis are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report prepared for:

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078

Project: Belews - FGD WWTS Bi-Monthly Sampling) (LIMS #J13020369)

March 8, 2013

1. Sample Reception

Four (4) aqueous samples in 125mL HDPE bottles (provided by Applied Speciation and Consulting) were submitted for selenium speciation analysis on February 28, 2013. The samples were received on March 1, 2013 in a sealed container at 1.7°C.

The samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and were designated discrete sample identifiers. An aliquot of each sample was filtered (0.45µm) and each filtrate was stored in a secure, monitored cryofreezer (maintained at a temperature of -80^{o}C) until selenium speciation analysis could be performed via ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS).

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Selenium Speciation Analysis by IC-ICP-CRC-MS Prior to analysis, an aliquot of each sample was filtered with a syringe filter (0.45µm) and injected directly into an autosampler vial. No further sample preparation was performed as any chemical alteration of a sample may shift the equilibrium of the system, resulting in changes in speciation ratios.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of

each analytical day. All calibration curves, associated with each species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimum interval of every ten analytical runs.

Selenium Speciation Analysis by IC-ICP-CRC-MS Each sample for selenium speciation analysis was analyzed by ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS) on March 7, 2013. An aliquot of each sample is injected onto an anion exchange column and mobilized by a basic (pH > 7) gradient. The eluting selenium species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (CRC) containing a reaction gas which preferentially reacts with interfering ions of the same target mass to charge ratios (m/z). A solid-state detector detects ions transmitted through the mass analyzer and the resulting current is processed by a data handling system.

Retention times for each eluting species are compared to known standards for species identification.

4. Analytical Issues

The overall analyses went well and no significant analytical issues were encountered. All quality control parameters associated with the samples were within acceptance limits.

The estimated method detection limits (eMDLs) for selenite, selenate, and selenocyanate are generated from replicate analyses of the lowest standard in the calibration curve. Not all selenium species are present in preparation blanks; therefore, eMDL calculations based on preparation blanks are artificially biased low.

The eMDL for methylseleninic acid and selenomethionine is calculated from the average eMDL of selenite, selenate, and selenocyanate. The calibration does not contain methylseleninic acid or selenomethionine due to impurities in these standards which would bias the results for other selenium species.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Selenium Speciation Results for Duke Energy
Project Name: Belews - FGD WWTS Bi-Monthly Sampling)
Contact: Jay Perkins
LIMS #J13020369

Date: March 8, 2013
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Sample Results

Sample ID	Se(IV)	Se(VI)	SeCN	MeSe(IV)	SeMe	Unknown Se Species (n)
FGD Purge Eff	330	79.1	ND (<2.6)	8.2	ND (<4.1)	0.0 (0)
BioReactor 1 Inf	24.5	62.8	ND (<0.65)	5.5	ND (<1.0)	10.4 (1)
BioReactor 2 Eff	ND (<1.7)	ND (<0.73)	ND (<0.65)	ND (<1.0)	ND (<1.0)	0.0 (0)
Metals Trip Blk	0.162	0.043	ND (<0.026)	ND (<0.041)	ND (<0.041)	0.0 (0)

All results reflect the applied dilution and are reported in µg/L
ND = Not detected at the applied dilution
SeCN = Selenocyanate
MeSe(IV) = Methylseleninic acid
SeMe = Selenomethionine
Unknown Se Species = Total concentration of all unknown Se species observed by IC-ICP-MS

Selenium Speciation Results for Duke Energy
Project Name: Belews - FGD WWTS Bi-Monthly Sampling)
Contact: Jay Perkins
LIMS #J13020369

Date: March 8, 2013
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

Analyte (µg/L)	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL*	eMDL 10x	eMDL 250x	eMDL 1000x
Se(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.068	1.7	6.8
Se(VI)	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.029	0.73	2.9
SeCN	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.026	0.65	2.6
MeSe(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.041	1.0	4.1
SeMe	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.041	1.0	4.1

eMDL = Estimated Method Detection Limit
*Please see narrative regarding eMDL calculations

Quality Control Summary - Certified Reference Materials

Analyte (µg/L)	CRM	True Value	Result	Recovery
Se(IV)	LCS	4.79	4.89	102.2
Se(VI)	LCS	4.74	4.59	96.9
SeCN	LCS	4.46	4.40	98.6
MeSe(IV)	LCS	3.24	3.05	94.3
SeMe	LCS	4.66	4.48	96.0

Selenium Speciation Results for Duke Energy
Project Name: Belews - FGD WWTS Bi-Monthly Sampling)
Contact: Jay Perkins
LIMS #J13020369

Date: March 8, 2013
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Matrix Duplicates

Analyte (µg/L)	Sample ID	Rep 1	Rep 2	Mean	RPD
Se(IV)	Batch QC	ND (<6.8)	ND (<6.8)	NC	NC
Se(VI)	Batch QC	ND (<2.9)	ND (<2.9)	NC	NC
SeCN	Batch QC	ND (<2.6)	ND (<2.6)	NC	NC
MeSe(IV)	Batch QC	ND (<4.1)	ND (<4.1)	NC	NC
SeMe	Batch QC	ND (<4.1)	ND (<4.1)	NC	NC

ND = Not detected at the applied dilution
NC = Value was not calculated due to one or more concentrations below the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte (µg/L)	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	MSD Result	Recovery	RPD
Se(IV)	Batch QC	5560	5658	101.8	5560	5534	99.5	2.2
Se(VI)	Batch QC	5045	5009	99.3	5045	4890	96.9	2.4
SeCN	Batch QC	4575	4462	97.5	4575	4451	97.3	0.3

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

ORDER# J13020369 | MATRIX: OTHER | Samples Originating From NC___ SC___

Logged By cpk | Date & Time 2-28-13 1003

SAMPLE PROGRAM: Water ___ Ground ___ NPDES ___ Drinking Water ___ UST ___ RCRA Waste ___

1.8 Cooler Temp (C)

AS&C
PO#133241

[19]Page 1 of 2

DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Customer must Complete

1)Project Name	Belews - FGD WWTS Bi-Monthly Sampling)	2)Phone No:
2) Client:	Bill Kennedy, Melonie Martin, Wayne Chapman, Travis Thornton **	4)Fax No:
5)Business Unit:	6)Process:	Mail Code:
8)Oper. Unit:	9)Res. Type:	10)Reso. Center:

MR #

Customer to complete all appropriate non-shaded areas.

[15]Preserv.: 1=HCl, 2=H_2SO_4, 3=HNO_3, 4=Ice, 5=None

Customer to complete appropriate columns to right.

Sampling conducted: 2nd and 4th Wednesday

LAB USE ONLY [11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	TDS	Br (Dionex)	Metals* + Hg**	Mn (ICP) Se (IMS), sol	Se. speciation - vendor to AS&C (Important to place filled bottle back into both baggies)
								[16]Analyses Required				
								4	4	3,4	3,4	4
2013004289		FGD Purge Eff	2/27/13	7:30am	TO			1	1	1	1	1
90		EQ Tank Eff.								1	1	
91		BioReactor 1 Inf								1**	1	1
92		BioReactor 2 Inf								1**		
93		BioReactor 2 Eff							1	1		1
94		Filter Blk									1	
95		Metals Trip Blk	2/27/13	730am	TO					1**		1
								1	2	6	4	4

Filtering of the Se is performed in the field please provide a filter blank too.

Customer to sign & date below - fill out from left to right.

1) Relinquished By: TO	Date/Time: 2/27/13	2) Accepted By: cpk	Date/Time: 2-28-13
3) Relinquished By:	Date/Time:	4) Accepted By:	Date/Time:
5)Relinquished By:	Date/Time:	6)Accepted By:	Date/Time:
7)Relinquished By: cpk	Date/Time: 2-28-13	8)Accepted By:	Date/Time:
9)Seal/Locked By: cpk	Date/Time: 2-28-13	10) Seal/Lock Opened By: Jacki Ford	Date/Time: 3/1/13 1130 1.7°C
11)Seal/Locked By:	Date/Time:	12)Seal/Lock Opened By:	Date/Time:

Comments

* B, Mn by TRM/ICP As, Cr, Cu, Ni, Se, Ag, Zn by TRM/IMS 1**=No Hg ** travis.thornton@siemens.com

Customer, IMPORTANT! Please indicate desired turnaround.

[22]Requested Turnaround

14 Days ___

*7 Days ___

*48 Hr ___

*Other 3-14-13

* Add. Cost Will Apply

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

ORDER# J13020369 | MATRIX: OTHER | Samples Originating From NC___ SC___

Logged By cpk | Date & Time 2-28-13 1003

SAMPLE PROGRAM: Water ___ Ground ___ NPDES ___ Drinking Water ___ UST ___ RCRA Waste ___

1.8 Cooler Temp (C)

AS&C PO#133241

[19]Page 1 of 2

DISTRIBUTION: ORIGINAL to LAB, COPY to CLIENT

Customer must Complete

1)Project Name: Belews - FGD WWTS Bi-Monthly Sampling)		2)Phone No:
2) Client: Bill Kennedy, Melonie Martin, Wayne Chapman, Travis Thornton **		4)Fax No:
5)Business Unit:	6)Process:	Mail Code:
8)Oper. Unit:	9)Res. Type:	10)Reso. Center:

MR #

Customer to complete all appropriate non-shaded areas.

Sampling conducted: 2nd and 4th Wednesday

[15]Preserv.: 1=HCL 2=H_2SO_4 3=HNO_3 4=Ice 5=None

LAB USE ONLY

Customer to complete appropriate columns to right

[11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	[16]Analyses Required: TDS	Br (Dionex)	Metals* + Hg**	Mn (ICP) Se (IMS), sol	Se, speciation - vendor to AS&C (Important to place filled bottle back into both baggies)
								4	4	3,4	3,4	4
2013004289		FGD Purge Eff	2/27/13	7:30am	TO			1	1	1	1	1
90		EQ Tank Eff.								1	1	
91		BioReactor 1 Inf								1**	1	1
92		BioReactor 2 Inf								1**		
93		BioReactor 2 Eff							1	1		1
94		Filter Blk									1	
95		Metals Trip Blk	2/27/13	730am	TO					1**		1
								1	2	6	4	4

Filtering of the Se is performed in the field please provide a filter blank too.

Customer to sign & date below - fill out from left to right.

1) Relinquished By: TO	Date/Time: 2/27/13	2) Accepted By: cpk	Date/Time: 2-28-13
3) Relinquished By	Date/Time	4) Accepted By	Date/Time
5)Relinquished By	Date/Time	6)Accepted By:	Date/Time
7)Relinquished By: cpk	Date/Time: 2-28-13	8)Accepted By:	Date/Time
9)Seal/Locked By: cpk	Date/Time: 2-28-13	10) Seal/Lock Opened By	Date/Time
11)Seal/Locked By	Date/Time	12)Seal/Lock Opened By	Date/Time

Comments

Customer, IMPORTANT! Please indicate desired turnaround.

[22]Requested Turnaround

14 Days ___

*7 Days ___

*48 Hr ___

*Other 3-14-13

* Add. Cost Will Apply

* B, Mn by TRM/ICP As, Cr, Cu, Ni, Se, Ag, Zn by TRM/IMS 1**=No Hg ** travis.thornton@siemens.com